Ground Water Protection in Virginia

Twenty First Annual Report of the Ground Water Protection Steering Committee

Virginia Ground Water Festivals:

These pictures are taken from educational events promoting ground water and natural resource protection. Local volunteers host the events at Camp Kekoka on the Northern Neck, Breaks Interstate Park in Dickenson County, and Russell County Fairgrounds in Castlewood, Virginia. For more information see the accompanying article on page 2.

Funding for the Virginia Ground Water Protection Steering Committee activities, including development of this Report, is provided through a grant to the Department of Environmental Quality by the U.S. Environmental Protection Agency.

Ground Water Festivals ■ CONTINUED FROM PAGE 1

http://www.deq.virginia.gov/gwpsc

Local volunteers organized ground water festivals in three different locations to teach sixth grade students and their teachers about ground water protection concepts and to improve environmental stewardship across the Commonwealth.

In mid May 2007 two hundred sixty five sixth grade students from Russell County public schools attended a Natural Resource festival held at the Russell County fairgrounds. Ms. Angela White with the Clinch Valley Soil and Water Conservation District organized the festival. Nineteen educators and forty six volunteers manned fourteen educational stations covering many aspects of our environment.

Two festivals held for the Lancaster County and Northumberland County sixth graders were organized by Mrs. Audrey Brainard, Mrs. Kathy Moeller, and Ms. Maggie Peill. Two hundred twenty seven students attended the festivals which were held at the YMCA's Camp Kekoka.

In mid October 2007 four hundred fifty Dickenson and Buchanan County sixth graders attended three festivals held at Breaks Interstate Park. Mr. Toby Edwards with the Cumberland Plateau Regional Waste Management Authority organized the festivals with assistance from Mr. Jerry Ward, Mr. Richard Lee, and Ms. Bonnie Mullins from the Buchanan County Litter Control and Recycling Office and from Mr. Eugene Mullins and Mr. Lester Turner from the Dickenson County Litter Control and Recycling Office.

Students attending the festivals received lunch bags with the festival logo.

For more information on the festivals contact Mary Ann Massie at the Virginia Department of Environmental Quality mamassie@deq.virginia.gov

The following organizations supported the 2007 festivals. Their support, through volunteer staff time and/or funding, is greatly appreciated.

US Environmental Protection Agency
Virginia Department of Environmental Quality
Clinch Valley Soil and Water Conservation District
USDA Natural Resources Conservation Service
OSM/VISTA representative with the Upper Tennessee River Roundtable
Castlewood High School
Russell County Farm Service Agency
Cumberland Plateau Regional Waste Management Authority
Russell County Litter Control and Recycling Office
Virginia Department of Mines, Minerals, and Energy
Virginia Department of Forestry
Russell County Health Department
Virginia Cooperative Extension
Virginia Department of Game and Inland Fisheries
OSM/VISTA representative with the Clinch Valley SWCD
Northumberland Association for Progressive Stewardship
Chesapeake Bay Garden Club
Mt. Olive Baptist Church
Northern Neck Audubon Society
Northumberland County Health Department (Three Rivers Health District)
Northumberland High School Teachers for Tomorrow
Peninsula YMCA – Camp Kekoka
Rappahannock Garden Club
SAIF Water Wells Inc.
TriStar Supermarket
Sal's Italian Pizza Inc.
Breaks Interstate Park/Virginia Department of Conservation and Recreation
Dickenson County Litter Control and Recycling Office
Buchanan County Litter Control and Recycling Office/Keep Buchanan Beautiful
Lonesome Pine Soil and Water Conservation District
Big Sandy Soil and Water Conservation District
Cumberland Plateau Health District
McClure and Russell Fork River Groups
Buchanan and Dickenson County Schools

Wellhead Protection in the Commonwealth

http://www.deq.virginia.gov/gwpsc/whp

http://www.vdh.virginia.gov/drinkingwater/source/wellheadsteps.htm

Wellhead protection activities continue to increase in the Commonwealth. While there has not been a stampede to graduate **from assessing** a public water supply's contamination susceptibility **to implementing** measurable protection activities, there continues to be interest at the local level in developing strategies to protect ground water resources. These local efforts are often buoyed by technical support from Virginia Department of Health (VDH) field office staff, the VDH contract with Olver Inc., or grants issued through the Virginia Department of Environmental Quality in conjunction with VDH.

The 1996 amendments to the Safe Drinking Water Act (SDWA) expanded protection concepts from ground water based public water supply systems to all sources of water serving public water supply systems, including surface water. The 1996 amendments also required assessments to evaluate every public water supply system's vulnerability or susceptibility to contamination. These mandatory assessments were supported with dedicated funding from the Drinking Water State Revolving Loan (DWSRF) set asides; assessments were completed by the Virginia Department of Health (VDH). Information gained through the assessments was shared with system owners and consumers. Federal and State officials were hopeful these assessments and susceptibility determinations would be the foundation for protection programs.

Opportunities to fund wellhead protection activities:

Following Federal approval of the State's Voluntary Wellhead Protection Plan, DEQ and VDH worked together to issue a "Request for Proposals" from local governments to implement wellhead protection. A combination of SDWA set aside funds and Clean Water Act funds were used to fund the projects. Three awards were made in 2005 totaling $31,250. A second "Request for Proposals" from local governments to implement wellhead protection was issued July 2006. Four awards were made totaling $147,390. A third "Request for Proposals" was issued in July 2007. Six proposals were received with three awards made totaling $182,858. Interest in the grants continues to increase. Unfortunately funding levels are not increasing. However, as long as VDH and DEQ are able to earmark a portion of their federal dollars toward implementation these "Request for Proposals" will continue. Our goal is to issue the request annually in June or July to enable contracts to be in place by October 1. Information can be found at http://www.deq.state.va.us/gwpsc/whp.html

Opportunities for technical assistance:

The Virginia Department of Health (VDH) and its contractor, Olver Incorporated, have implemented a program for assisting small community groundwater waterworks in developing wellhead protection plans. Through this program, small waterworks are contacted by Olver Incorporated to describe the program and its benefits, and to determine the waterworks interest in participating in the program. Olver then assists the participating waterworks in forming a community-based local advisory committee and works with that committee to identify potential sources of contamination for their water sources and to develop a wellhead protection plan to prevent contamination of their drinking water supply. As part of this program, a public information brochure is also prepared specifically for each waterworks to inform and educate the local community. The brochure includes a general overview of the importance of source water protection; the local nature of ground water recharge and concerns with local geology; concerns with septic systems and wells; and a list of general "dos" and "don'ts". To date, over thirty community waterworks have completed wellhead protection plans through this program and approximately forty more are in various stages of program development; examples of two waterworks that have recently completed a wellhead protection plan are summarized in the following paragraphs.

The Virginia Ridge Water Company provides water to 150 residents in the Virginia Ridge subdivision in Bedford County. Bedford County has a wellhead protection overlay district in place to protect public water sources from contamination. However, Virginia Ridge's wells did not come online until after the overlay district was already in place and therefore were not included. Once the Virginia Ridge Water Company's wellhead protection plan development was underway, the local advisory committee decided the company should request that the wells within the subdivision be included in the wellhead protection overlay district in the County. During the rezoning request process, the committee learned that a gas station was requesting a special use permit

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Wellhead Protection in the Commonwealth ■ CONTINUED FROM PAGE 3

on SC-634 within the 1,000-ft radius of the wells (and within the proposed wellhead protection overlay district for the well). The committee was concerned about this proposed gas station due to the use of underground storage tanks (USTs) and possible leakage and resulting contamination of the drinking water resource. Members of the local advisory committee and the local community attended several planning commission meetings to speak in support of the wellhead protection overlay district zoning change and to voice their concerns regarding the gas station as a potential source of contamination within their wellhead protection area. The meetings resulted in a heightened awareness for ground water protection for members of the community and members of the Bedford County planning commission. The planning commission has recommended the subdivision be included in the wellhead protection overlay district. The Board of Supervisors will take action on the request in 2008. In addition to the efforts for inclusion into the wellhead overlay district, other provisions for wellhead protection in the subdivision included: distribution of the site-specific public education brochure and information on septic system maintenance to the local residents; determining the feasibility of the water company taking responsibility for the maintenance of the septic tanks closest to the wells; installation of signs along the highway to alert commuters and residents they are in a wellhead protection area; and, modification of the roof drains from the water treatment plant building to redirect storm water run off away from the wells.

Another wellhead protection plan that was completed this year was that of Woodberry Forest School in Madison County, Virginia which serves 600 residents. The school's water needs are supplied through two drinking water wells located on the school grounds. The diversity of both existing and planned facilities at this site posed unique challenges for this facility. Some of the facilities and potential sources of contamination at the school included a golf course, underground heating oil tanks, underground gasoline storage tanks, septic systems, and abandoned wells. In addition, the facility was planning to expand its stadium located within the groundwater recharge area. As a result, one of the measures included in the wellhead protection plan was a contractor education program required for contractors working within the wellhead protection area. An informational flyer was developed that contractors were required to read and sign off on before beginning work in the wellhead protection area. As a result of this educational program, when a contractor had an insect problem within one of their work trailers, they consulted the School staff regarding best management practices before taking any action to ensure that the potential for ground water contamination was minimized. Other wellhead protection implementation items included in the School's plan include continued regular maintenance of septic systems; identification and abandonment of wells not in use per VDH guidelines; continuance of following manufacturer's recommendations on fertilizer use at the school and golf course; regular inspections of fuel and chemical storage areas including training personnel; and, consideration of wellhead protection in all future land use and construction projects.

To date, a total of seventy-one facilities serving a combined population of 47,151 have developed or are in the process of developing wellhead protection plans through this VDH program. These waterworks include:

1. Town of Round Hill (Loudoun County)
2. Town of Hamilton (Loudoun County)
3. Town of Rural Retreat (Wythe County)
4. Town of Edinburg (Shenandoah County)
5. Beacon Hill-(Loudoun County Sanitation Authority)
6. Lenah Farms-(Loudoun County Sanitation Authority)
7. Raspberry Falls-(Loudoun County Sanitation Authority)
8. Town of Lovettsville (Loudoun County)
9. Town of Fincastle (Botetourt County)
10. Town of Glasgow (Rockbridge County)
11. Grafton School (Clarke County)
12. Town of Middleburg (Loudoun County)
13. Lucketts MHP (Loudoun County)
14. Retreat Subdivision (Clarke County)
15. Clarke County Sanitation Authority (Clarke County)
16. Natural Bridge Station/Arnold's Valley (Rockbridge County Public Service Authority)
17. Mt. Jackson (Shenandoah County)
18. Curve Road (Giles County PSA)
19. Hoges Chapel (Giles County PSA)
20. Lurich Road (Giles County PSA)
21. Powell Mountain (Giles County PSA)
22. Stoney Creek (Giles County PSA)
23. Ram/Wayside Community Water System (Giles County PSA)
24. Wolf Creek/Marlville (Giles County PSA)
25. Town of Rich Creek (Giles County PSA)
26. Town of Glen Lyn (Giles County PSA)
27. Town of Narrows (Giles County PSA)
28. Town of Pearisburg (Giles County PSA)
29. Town of Pembroke (Giles County PSA)
30. Fairview Acres (Giles County PSA)
31. Edgewood Water Company (Giles County PSA)
32. Johnson's Mobile Home Park (Rockbridge County)
33. Amelia Courthouse (Amelia County)
34. Montvale Water, Inc. (Bedford County)
35. Woodberry Forest School (Madison County)
36. Ashwood – (Bath County Service Authority)

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37. Bath County Regional Water – (Bath County Service Authority)
38. Cedar Creek – (Bath County Service Authority)
39. Clifton Forge Mountain – (Bath County Service Authority)
40. Millboro Water Association – (Bath County Service Authority)
41. Woodland Mobile Home Park (Amherst County)
42. Porter Farm Subdivision (Tazewell County)
43. Town of Remington (and Lee's Glen Subdivision) (Fauquier County)
44. Mountain View Shores Subdivision (Bedford County PSA)
45. Hillcrest Subdivision (Bedford County PSA)
46. Valley Mills Crossing (Bedford County PSA)
47. Virginia Ridge Water Company (Bedford County)
48. Central Water Company (Botetourt County)
49. Santillane Water Company, Inc (Botetourt County)
50. Reserve at Rokeby Farm (Loudoun County Sanitation Authority)
51. Elysian Heights (Loudoun County Sanitation Authority)
52. Selma Estates (Loudoun County Sanitation Authority)
53. Opal Regional (Fauquier County Water and Sanitation Authority)
54. Vint Hill (Fauquier County Water and Sanitation Authority)
55. The Plains (Fauquier County Water and Sanitation Authority)
56. Auburn Crossing (Fauquier County Water and Sanitation Authority)
57. Bethel Academy (Fauquier County Water and Sanitation Authority)
58. Botha Subdivision (Fauquier County Water and Sanitation Authority)
59. Catlett Subdivision (Fauquier County Water and Sanitation Authority)
60. Green Meadows Subdivision (Fauquier County Water and Sanitation Authority)
61. The Meadows (Fauquier County Water and Sanitation Authority)
62. Paris Water System (Fauquier County Water and Sanitation Authority)
63. Turnbull (Fauquier County Water and Sanitation Authority)
64. Whitewood Forest (Fauquier County Water and Sanitation Authority)
65. Marshall Waterworks (Fauquier County Water and Sanitation Authority)
66. Stallion Run Estates (Bedford County)
67. Town of Burkeville (Nottoway County)
68. Pineview Assisted Living, Inc. (Appomattox County)
69. Bull Run Mountain Upper (Prince William Service Authority)
70. Bull Run Mountain Lower (Prince William Service Authority)

The Ground Water Protection Steering Committee is an inter-agency advisory committee formed to stimulate, strengthen and coordinate ground water protection activities in the Commonwealth. The Annual Reports allow us to highlight our progress; to educate Virginia citizens, businesses, and officials about the importance of ground water; and to publicize state programs that can assist those relying on ground water to ensure its continued quality and availability.

Particular emphasis is made at the meetings on education and information exchange. Meetings are open to the public. In 2007 our members and guests heard presentations on activities in DEQ's Office of Ground Water Withdrawal Permitting, VDACS' Office of Pesticide Services, and DEQ's DRAFT water reclamation and reuse regulations. We were also treated to a tour of the Division of Consolidated Laboratory Services. For more information on the Steering Committee visit www.deq.virginia.gov/gwpsc or call Mary Ann Massie at 804-698-4042.

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The Ground Water Protection Steering Committee meeting is held on the third Tuesday of March, May, July, September, and November.

Meetings are generally held at the Department of Environmental Quality, 629 East Main Street, Richmond from 9 a.m. to 11 a.m. Meetings are open to the public.

For more information contact Mary Ann Massie at DEQ 8040-698-4042 or email mamassie@deq.virginia.gov or visit www.deq.virginia.gov/gwpsc

Meeting summaries and announcements are posted on the Regulatory Townhall at www.townhall.virginia.gov

Ground Water Withdrawal Permitting Program Anticipates New Eastern Shore Model

The Ground Water Withdrawal Permitting Program (GWPP) of the Virginia Department of Environmental Quality (DEQ) is looking forward to the release of two new and improved regional ground water models. The U.S. Geological Survey (USGS) has been working in cooperation with the Hampton Roads Planning District Commission (HRPDC) and DEQ to create an updated model of the Virginia Coastal Plain, and with the Accomack-Northampton Planning District Committee (ANPDC) and DEQ to create an updated model of the Eastern Shore of Virginia. In early 2008, GWPP staff plan to implement the new Eastern Shore model as a useful tool for evaluating ground water conditions in Northampton and Accomack counties. In anticipation of the model release, GWPP staff have worked with a beta version of the model and reviewed a draft of the model documentation set to be published in 2008.

The new Eastern Shore Model was developed with the USGS code SEAWAT (A Computer Program for Simulation of Three-Dimensional Variable-Density Ground-Water Flow), and will replace the Eastern Shore SHARP model developed in the early 1990s.

The hydrogeologic framework from the old SHARP model was incorporated into the new model, and includes an unconfined, surficial aquifer, a series of three confining units and three confined aquifers (the Upper, Middle, and Lower Yorktown-Eastover aquifers), and a basal confining unit (the St. Marys confining unit). In addition, the new framework incorporates two paleochannel aquifers. Improvements from the old model include the simulation of salinity changes and refined hydraulic conductivity fields.

The old model was developed prior to the current generation of personal computers (that offer fast processing speeds and large data storage drives). The new model takes full advantage of current computing power by calculating aquifer system changes for smaller areas and by considering the specific transmitting properties of the confining material between the aquifers. All of these revisions work together to improve both precision and accuracy of the primary tool used to make ground water resource management decisions.

The release of the new Eastern Shore model is coming at an important time for water management on the Eastern Shore, as demands for ground water withdrawals for public supply, domestic, industrial, and agricultural uses are increasing. DEQ staff are currently evaluating proposed increases in ground water withdrawals for major ground water users spread throughout the peninsula. The GWPP modeling staff expect that the new model will be an important tool for evaluating these withdrawals.

Finally, the GWPP hired a co-op student that will be working with the new Eastern Shore model. The student will use methods of model calibration and sensitivity analysis to try to determine where new data can be collected to further improve the model.

Some of the information about the Eastern Shore model in this article came from the draft documentation of the model, prepared by Ward Sanford of the USGS. Questions about DEQ ground water modeling activities can be addressed to the GWPP team leader Robin Patton rwpatton@deq.virginia.gov, or modeling staff member Jenny Holloway jwholloway@deq.virginia.gov.

OFFICE OF LAND APPLICATION PROGRAMS

Beginning January 1, 2008 the Virginia Department of Environmental Quality will assume regulatory oversight of all land application of treated sewage sludge, commonly referred to as biosolids. This action, which moves oversight of the Biosolids Use Regulations from the Virginia Department of Health to DEQ, was at the direction of the 2007 General Assembly, which voted to consolidate the regulatory programs so that all persons land applying biosolids would be subject to uniform requirements, and to take advantage of the existing compliance and enforcement structure at DEQ. The Virginia Department of Health will continue to consult with DEQ and advise the public on health issues related to biosolids applications.

DEQ established the Office of Land Application Programs within the Water Quality Division to manage the biosolids program. Also, due to the similarities with other predominantly "no-discharge" programs, this office will also direct regulatory, permitting and compliance activities for the land application of industrial sludges, septage, livestock and poultry waste, as well as water reclamation and reuse.

Neil Zahradka is the manager of the Office of Land Application, and can be reached at nrzahradka@deq.virginia.gov or (804) 698-4102. The following OLAP central office staff will be responsible for the various program functions:

Animal Feeding Operations:
Betsy Bowles bkbowles@deq.virginia.gov (804) 698-4059

Biosolids Compliance:
Brian Cauthorn bacauthorn@deq.virginia.gov (804) 698-4592

Biosolids Regulation and Guidance:
Christina Wood cmwood@deq.virginia.gov (804) 698-4263

Residuals Treatment Engineering:
Charlie Swanson cwswanson@deq.virginia.gov (804) 698-4171

Water Reclamation/Reuse and Land Treatment:
Valerie Rourke varourke@deq.virginia.gov (804) 698-4158

WASTE DIVISION UPDATES

http://www.deq.virginia.gov/waste/homepage.html

Update on clean-up initiatives at hazardous waste facilities

DEQ will be working cooperatively with EPA Region 3 to address clean-up at 122 sites statewide where the agencies plan to have largely completed clean-up activities by the year 2020. These sites, referred to as the "2020 Corrective Action Universe," include all facilities believed to need corrective action in Virginia, as well as those with already ongoing or completed cleanups. Fifty-nine of the Virginia sites are actively in the Corrective Action process. Sixty-three "new" sites have been added, although some have already started work while others are just getting started. Nationwide, the Environmental Protection Agency (EPA) has identified 3,746 RCRA facilities for this 2020 Corrective Action Universe. For further information on this initiative please visit http://www.epa.gov/epaoswer/hazwaste/ca/facility.htm#2020

Staffing update

The ground water section in the Office of Hazardous Waste is fully staffed as of November 10th, 2007. The ground water team consists of Erich Weissbart (ejweissbart@deq.virginia.gov), Heather Lloyd (helloyd@deq.virginia.gov), Fuxing Zhou (fzhou@deq.virginia.gov), Trisha Johnson (tbjohnson@deq.virginia.gov), and the team leader Jutta Schneider. The organizational objective of the Office of Hazardous Waste's ground water section is to protect Virginia's environment and citizens' health through the evaluation and the issuance of hazardous waste permit amendments and the review of environmental plans and data. Staff review and evaluate hazardous waste ground water monitoring plans, corrective action plans, permit amendment applications, and environmental monitoring data. Jutta Schneider can be reached at (804) 698-4099 or jschneider@deq.virginia.gov

For the Office of Solid Waste, ground water positions remain vacant in DEQ's Regional Offices for the Piedmont, Tidewater and South Central regions as of November 30th, 2007. The Solid Waste Ground Water Program Coordinator in the Central Office is Geoff Christe, who can be reached at gxchriste@deq.virginia.gov or at (804) 698-4283.

Underground Storage Tanks (USTs) – Regulatory Update

New Federal Energy Act Requirements and the New Proposed State Underground Storage Tank (UST) Program Regulations - Underground Storage Tanks: Technical Standards and Corrective Action Requirements - 9 VAC 25-580

The state UST regulation was last amended on March 24, 2004 and now new amendments are necessary to incorporate tank secondary containment, delivery prohibition, and operator training requirements imposed by the federal Energy Policy Act of 2005 (see: http://www.epa.gov/swerust1/ for all the federal changes.) A requirement for DEQ to inspect all active USTs every three years will be performed under the current regulations and law and requires no regulation amendment.

Any new UST regulations will affect owners and operators of underground storage tank facilities statewide. At present our DEQ database indicates that there are some 6,800 active facilities in the Commonwealth with a total of more than 20,000 active tanks. There are over 3,300 active-tank owners.

The draft timeline for this regulation amendment is as follows:

Feb 2007 - April 2007	Internal DEQ TAC Conference Calls
May 2007	File NOIRA
Summer 2007	Public meeting
Fall/Winter 2007	TAC meetings
Spring 2008	Present to Water Board as proposed
Spring 2008	Review by DPB, Governor's Office
Summer/Fall 2008	Comment period
Fall/Winter 2008	Proposed final to Water Board
Winter 2008	Review by SNR, Governor's Office
Winter 2009	Published in VA Register
Winter/Spring 2009	Effective date of Amendment

An additional timeline for the operator training requirements portion will track several months later.

The initial Notice of Intended Regulatory Action (NOIRA) went through a review by the Director's and Secretary's Office before publication on the Virginia Town Hall website. There was a 60-day comment period; a public meeting was held during the comment period. DEQ accepted comments at the public meeting and solicited names for consideration for the Technical Advisory Committee (TAC) which held its first meeting in December 2007. DEQ has 180 days to prepare proposed amendments to the regulation. During the 180 days DEQ will host three external TAC meetings, meet again with staff, provide draft language for review, and present a proposed amended regulation to the Water Board.

The regulatory amendments will revise Section 50 to require new and replacement underground storage tanks and piping within 1,000 feet of a public water supply or potable well to have secondary containment. The amendment will also add Section 370 to prohibit petroleum delivery to noncompliant tanks and in some cases, facilities. The process that the DEQ will follow to determine whether a tank requires secondary containment and to identify ineligible tanks and prohibit delivery to those tanks will be clarified in the guidance document. The operator training requirement amendment will follow through the same regulatory development process.

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Virginia Department of Environmental Quality

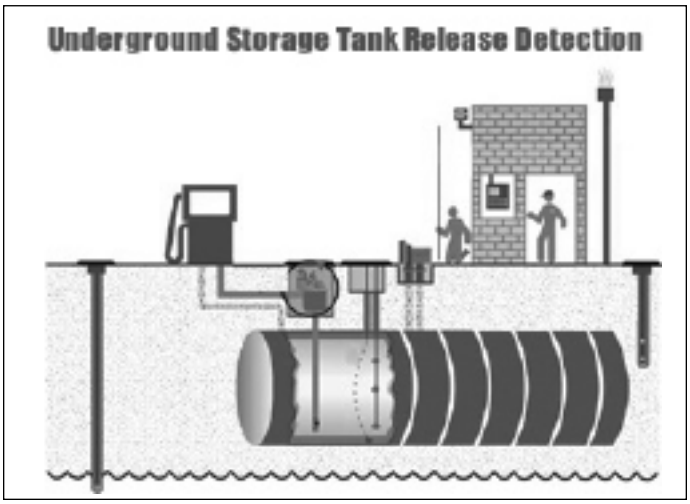
Underground Storage Tanks (USTs) – Regulatory Update ■ CONTINUED FROM PAGE 8

These amendments are necessary to conform to requirements imposed by the passage of the Energy Policy Act. Implementation of the secondary containment, delivery prohibition, operator training, and three-year UST inspection requirements are a condition of DEQ's receiving future federal UST/LUST grant funding.

Guidance for this regulation is already in place in the form of the Petroleum Storage Tank Compliance Manual at: http://www.deq.virginia.gov/waterguidance/pdf/012025.pdf. DEQ will revise the current guidance to add sections on secondary containment and delivery prohibition and any other changes needed. Development of the guidance will begin once the proposed regulation has gone to public comment, with a goal of finalizing the guidance shortly following final adoption by the Board. The team will work together to create the necessary guidance and incorporate it into the existing Compliance Manual.

After Board approval is received, Office of Spill Response and Remediation staff will develop training on the changes to the regulation and will provide this training to the regional office staff through a series of regional office events. Guidance will be reviewed 1 to 2 years after implementation to determine if revisions are necessary.

Article submitted by Russell Ellison, rpellison@deq.virginia.gov



Virginia Department of Mines, Minerals and Energy

On September 14, 2007, Virginia's Secretary of Technology Aneesh P. Chopra announced that the Department of Mines, Minerals and Energy (DMME) had received a Digital Government Achievement Award from the Center for Digital Government in their 2007 recognition program. The Digital Government Achievement Award (DGAA) is a national program that recognizes outstanding agency and department Web sites and applications that enhance information interactions, transactions and/or services. DMME was honored with the Digital Government Achievement Award in the Government to Business category for its "WaterTrans" application for the Division of Mined Land Reclamation (DMLR). It provides the division and its customers with information critical to the development, permitting, regulation and operation of surface mining operations in Virginia. This application provides DMLR staff and customers, with the most up to date information in an easy-to-use and integrated fashion and is part of DMME's long-term commitment to provide cost effective information management tools that bring value to the agency and its customers.

DMLR now has thirteen years of water monitoring data in an electronic database, which includes the NPDES, stream, and ground water monitoring for the southwest Virginia coal mining area. The WaterTrans application allows staff to specify monitoring points, time periods and parameters and then displays the selected data in Excel tables and graphs, allowing the DMLR staff and customers to better evaluate and utilize the water monitoring data.

Article submitted by Lynn Haynes, Lynn.Haynes@dmme.virginia.gov

The following agencies have representation on the Ground Water Protection Steering Committee:

- Virginia Department of Environmental Quality (chair)
- Virginia Department of Health
- Virginia Cooperative Extension
- Virginia Department of Business Assistance
- Virginia Department of Conservation and Recreation
- Virginia Department of Mines, Minerals, and Energy
- Virginia Department of Agriculture and Consumer Services
- Virginia Department of Housing and Community Development
- Virginia Department of General Services/Division of Consolidated Laboratory Services
- US Geologic Survey

Visit www.deq.virginia.gov/gwpsc for member links.

U.S. Geological Survey

http://va.water.usgs.gov/

A large scale effort by the U.S. Geological Survey (USGS) for region-wide characterization of ground water throughout the Virginia Coastal Plain continued during 2007, in cooperation with the Virginia Department of Environmental Quality (DEQ) and the Hampton Roads Planning District Commission (HRPDC) (see 2000-07 Annual Reports). Southeastern Virginia, the York-James Peninsula, and the Virginia Eastern Shore have been designated by the Commonwealth of Virginia as ground-water management areas, and ground-water withdrawals on the Middle Peninsula and Northern Neck also are increasing. The Eastern Shore is further distinguished as a sole source aquifer.

A refined hydrogeologic framework representing the aquifers and confining units across the entire Virginia Coastal Plain was published on-line during 2007 as USGS Professional Paper 1731, available at http://pubs.usgs.gov/pp/2006/1731/ . Printing and distribution are planned for 2008. Two new computer models of ground-water flow in the Virginia Coastal Plain also were completed during 2007, and are being documented in reports planned for publication during 2008. A model developed in cooperation with HRPDC and DEQ incorporates the refined framework along with reported ground-water withdrawals and estimates of unreported domestic withdrawals. Another model of ground-water flow on the Virginia Eastern Shore was developed in cooperation with the Accomack-Northampton PDC and DEQ. The framework and models will be used by local communities for long-term water supply planning, and by DEQ to support ground-water permitting decisions. A separate report on private domestic wells and withdrawals in the Virginia Coastal Plain is also planned for 2008.

Figure 1

One result of framework and model analyses is identification of areas needing improved data. Among these, some aspects of the hydrogeologic framework are poorly known on the Northern Neck. Accordingly, a 1,087-foot sediment core was drilled during March 2007 at Surprise Hill in Northumberland County **(figure 1)**, in cooperation with DEQ. The stratigraphic sequence exhibited by the core reveals new relations among the hydrogeologic units. Construction is planned for 2008 of a ground-water research station at the site, where ground-water level and chemical-quality data will be collected from a nested cluster of observation wells. Similarly, another research station near Sebrell in Southampton County is planned for 2008, in cooperation with HRPDC. Some model simulations have indicated water-level drawdowns in the area approaching the tops of aquifers. Actual conditions, however, have not been observed closely enough to adequately evaluate these model results. Sediment core and observation-well water levels will determine the true relation of drawdowns to the aquifers.

Another study to characterize the chemical quality of ground water in the Virginia Coastal Plain also continued during 2007, in cooperation with DEQ and HRPDC. Ground-water quality sample data initially retrieved from USGS data bases during 2006 were augmented from DEQ, U.S. Environmental Protection Agency (EPA), and Virginia Department of Health (VDH) data bases. The approximately 10,000 samples underwent quality-assurance analyses, and were

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integrated with the new hydrogeologic framework using a geographic information system. Interpretive analysis of the data was begun with a delineation of the freshwater-saltwater transition zone. Spatial characterization of major ions, general parameters, and secondary constituents is planned for 2008, and publication of study results for 2009.

Lastly, a study of the shallow aquifer system in Virginia Beach continued during 2007, in cooperation with the City of Virginia Beach. Shallow ground water is the primary domestic source in the southern part of the City, and is also withdrawn by residents toward the north for irrigation and seasonal needs. Ground-water levels, however, are below sea level in many areas and create the potential for saltwater intrusion. Study results are aiding the City in making sound water-resource management decisions. Efforts during 2007 include monitoring ground-water levels and chemistry, analyzing water samples for chloride and other major ions, geophysical logging of 7 wells to assess saltwater intrusion, and compiling a water balance for the northern part of the City. Monitoring during 2008 will focus on wells showing increased salinity. In the northern part of the City, drilling during 2008 will expand the network of observation wells from the south to better understand complex hydrostratigraphic relations. A survey of summertime water use by northern residents will also be started to clarify the effects of pumping on ground-water levels and flow.

The USGS continued the cooperatively funded assessments on the availability of ground water in the northern Shenandoah Valley carbonate and fractured-rock aquifer systems with Frederick, Warren, and Clarke counties, and continued the South Fork Shenandoah River Minimum Instream Flow (MIF) investigation in cooperation with the Northern Shenandoah Valley Regional Commission and the Central Shenandoah Planning District Commission. Construction and calibration of a regional ground-water-flow model of the Shenandoah Valley was completed to better define the availability of ground water in the region and its response to current and future development. The model represents a 7,500-km2 area that contains three hydrogeologic units that correspond to the major rock types in the Shenandoah Valley (siliciclastic rocks, carbonate rocks, and crystalline rocks). The model is documented in a draft Scientific Investigations Report that is currently in review and planned for publication during 2008.

Geophysical methods under development by the Office of Ground Water (OGW), Branch of Geophysics continue to be tested in the Shenandoah Valley to (1) delineate karst features including voids, conduits, pre-collapse sinkholes, fracture zones, and faults: and (2) observe and monitor hydrologic processes such as focused ground-water discharge. In 2007 sites were visited and surveyed using two additional innovative geophysical methods: (1) shear-wave seismic imaging; and (2) passive seismic imaging to determine sediment thickness over bedrock.

Additionally, in cooperation with the OGW, Ground-Water Resources Program gravity measurements were initiated in the Shenandoah Valley to gain insight into the porosity of the underlying fractured-bedrock aquifers in the region and their ground-water capacity. In cooperation with the DEQ Office of Ground-Water Characterization, the USGS will continue monitoring in the Valley and plan to expand this network into the Coastal Plain where storage-capacity and water-availability information are critical to resource-management efforts in the region.

The USGS continued measuring the concentrations of a suite of environmental tracers in discharge from some 50 springs in the Great Valley. The measurements include (among other chemical and isotopic parameters) carbon-14, chlorofluorocarbons, sulfur hexafluoride, tritium, tritium/helium-3, and two new environmental tracers that the USGS recently developed for ground-water dating – SF5CF3 and CFC-13. These new data are being interpreted to obtain information on: (1) ground-water age and ground-water residence time in spring discharge; (2) ground-water mixing and age distribution; and (3) the impact of anthropogenic inputs on spring discharge – contamination, susceptibility issues, and drinking-water issues.

In 2008 the USGS will complete the regional sampling phase of this investigation (each spring will have been sampled on at least two separate dates), and plan to begin approximately monthly sampling of discharge and age tracers in a sub-set of these springs – probably 5 springs, to learn more about the transient nature of age distribution in spring discharge in the Valley. The age information will help constrain ground-water models as they are developed.

Finally, the USGS and DEQ completed implementing a statewide network of conductivity probes and chloride samples to estimate the base-flow component of streams at gaging stations in Virginia. The Shenandoah Valley was selected for more intense data collection and all current stream-flow gaging stations are instrumented, as well as selected wells and springs. The data will be used to better understand the ground-water flow system and the interactions between the ground-water and surface-water systems, resulting in more accurate numbers for water budgets in water availability studies and enhancement of local and regional ground-water/surface-water models.

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OFFICE OF PESTICIDE SERVICES

http://www.vdacs.virginia.gov/pesticides/index/shtml

2007 Pesticide Disposal Program

The Virginia Department of Agriculture and Consumer Services (VDACS), in cooperation with the Virginia Pesticide Control Board and Virginia Cooperative Extension (VCE) completed the 2007 Pesticide Disposal Program in mid September. The program assists agricultural producers, pesticide dealers, pest control firms, golf course managers and homeowners with the proper disposal of unwanted agricultural, commercial, and household pesticides and is available at no cost to participants. A total of 76,249 pounds of canceled, banned or unwanted pesticides was collected and subsequently destroyed. Since its inception, Virginia's Pesticide Disposal Program has collected and destroyed a total of 1,407,415 pounds of pesticides.

The program, which is free for participants, is funded through pesticide fees collected by VDACS' Office of Pesticide Services.

The 2008 Pesticide Disposal Program will be conducted in Southwest Virginia and includes the following localities:

- counties of Alleghany, Bland, Botetourt, Buchanan, Carroll, Craig, Dickenson, Floyd, Giles, Grayson, Lee, Montgomery, Pulaski, Roanoke, Russell, Scott, Smyth, Tazewell, Washington, Wise, and Wythe; and
- cities of Bristol, Clifton Forge, Covington, Galax, Norton, Radford, Roanoke, and Salem.

For additional information visit the Virginia Department of Agriculture and Consumer Services website at http://www.vdacs.virginia.gov/pesticides/disposal.shtml or contact Liza Fleeson, Environmental Program Planner, Office of Pesticide Services, at liza.fleeson@vdacs.virginia.gov or 804-371-6561.

2007 Plastic Container Recycling Program

The Virginia Department of Agriculture and Consumer Services (VDACS), in cooperation with the Virginia Pesticide Control Board and Virginia Cooperative Extension (VCE) and local governments recycled a total of 36,135 pesticide containers from 19 localities and 8 pesticide dealer locations in 2007. Since its inception, Virginia's Plastic Pesticide Container Recycling Program has collected and granulated a total of 853,730 pesticide containers.

The Plastic Pesticide Container Recycling Program is an environmentally responsible alternative for the disposal of properly rinsed plastic pesticide containers. Granulated chips are transported to recycling facilities and fabricated into items such as pallets, fence posts, field drain tiles and parking stops thus keeping them out of landfills.

To participate in the Program, a locality must make application to VDACS and agree to collect, inspect and store the properly rinsed containers until granulation. VDACS provides $1,875 in reimbursement costs to participating localities to offset the cost of the program.

For additional information visit the Virginia Department of Agriculture and Consumer Services at http://www.vdacs.virginia.gov/pesticides/recycling.shtml or contact Liza Fleeson, Environmental Program Planner, Office of Pesticide Services, at liza.fleeson@vdacs.virginia.gov or 804-371-6561.

Pesticide disposal photo courtesy of Richard Jones, Pesticide Investigator, Lynchburg Territory

Plastic pesticide container photo courtesy of Amber Vallotton, Extension Agent, Rockingham County.